



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,361	08/21/2001	Mark T. Anderson	56762US003	7689
32692	7590	07/26/2004	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			LOPEZ, CARLOS N	
PO BOX 33427			ART UNIT	
ST. PAUL, MN 55133-3427			PAPER NUMBER	

1731

DATE MAILED: 07/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/934,361	ANDERSON ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Carlos Lopez	1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8,10-21,25-32 and 36 is/are pending in the application.
- 4a) Of the above claim(s) 25-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8,10-21 and 36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

***Response to Amendment***

The amendment filed on 5/3/04 has been entered. The amendment obviates the 35 USC 112 2<sup>nd</sup> paragraph rejection of claims 1-21 and the claim objection. In response to the arguments presented towards the Le Sergent rejection, the Kyoto reference is being cited to show that cladding of performs are highly doped with fluorine in order to have a large refractive index difference between the core and the cladding.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 36 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 36 recites a "1/4 a width of a diameter of the core", it is unclear how the diameter of the core has also a width. Clarification is requested.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Edvold et al (US 2002/0159735 A1). Edvold discloses making a DCF by the MCVD method wherein core dopants are deposited into a substrate tube. The DCF has a core 12, fluorine reservoir 14, and claddings 16 and 18, with suitable dopants. In one DCF design, the core 12 represented by pike 22 is doped with germanium (Ge), fluorine reservoir 14 represented by trench 24 is doped with fluorine (F), and the second cladding region represented by ridge 26 is doped with germanium and fluorine (G/F) (See paragraphs 19-20 and 26). To obtain a sufficiently deep trench 24 on either side of the core 22, the first cladding region 14 is doped with a relatively high concentration of fluorine dopant meeting the definition of Applicant's specification in page 6, which notes that a fluorine containing zone 120 acts as a "reservoir" outside of the core. The manufactured fiber having its fluorine reservoir at a higher concentration than its core and cladding as shown by the refractive index profile of figure 2 is inherently drawn from a substrate tube having a fluorine reservoir at a higher concentration than its core and cladding deposited layers.

Edvold fails to disclose fluorine in the core hence meeting claims 2-4.

As for claim 36, the formed fiber shown in figure 1 of Edvold has a core to a differential width of the fluorine reservoir ratio of less than  $\frac{1}{4}$  the diameter of the core.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5, 8, and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Le Sergent (US 5,364,429) in view of Kyoto et al (US 5,203,899). Le Sergent discloses making an optical fiber by the MCVD method wherein core dopants are deposited into a substrate tube (Col. 3, lines 30ff). Le Sergent discloses an optical fiber having a core region with a higher index of refraction than region c, deemed as the claimed "fluorine reservoir" and a peripheral cladding region e, deemed as the claimed cladding, which is lightly doped to have a higher index of refraction in relation to region c. The described optical fiber is thus consequently made from a preform having the described refractive index profile. While Le Sergent is silent disclosing how the large refractive index between the core and the cladding/"fluorine reservoir" is achieved, Kyoto notes that in order to achieve said large difference in refractive index between the "fluorine reservoir" and the core, the cladding/"fluorine reservoir" is conventionally doped with fluorine, a refractive index depressant, see Kyoto's measure 2 at Col. 1, lines 47ff. At the time the invention was made it would have been obvious to a person of ordinary skill in the art to have added fluorine to the "fluorine reservoir" of Le Sergent as taught by Kyoto in order to achieve the desired large refractive index difference between the core and the "fluorine reservoir".

It is thus reasoned that the "fluorine reservoir" would have a higher fluorine concentration than the core in view of Kyoto's teachings. Additionally, in view that the peripheral cladding region of Le Sergent has a higher refractive index than the "fluorine

reservoir" region due to the addition of  $P_2O_5$  an additive to increase the refractive index and with an index compensator in the amount of 0.1% fluorine, it is reasonable to conclude that the "fluorine reservoir" would have a higher fluorine concentration than that of said cladding region because fluorine is only added as a index compensator in the cladding region.

As for claim 8, the regions of high fluorine concentration (annulus C deemed as the claimed fluorine reservoir) and lightly doped regions as shown by annulus e collectively deemed by Le Sergent as the "cladding", have a fluorine concentration of at most 1% (Col. 2, lines 65ff).

As for claims 13-17 and 20-21, the claimed concentrations are encompassed by the disclosed concentration of claims 4 and 5 of Le Sergent.

As for claim 9, the core may have rare earth dopants (Col.3, line 44).

Claims 6-7 are rejected under 35 U.S.C. 103(a) as unpatentable over Edvold et al (US 2002/0159735 A1) in view of Abe EPO 0091738. As noted by Edvold fluorine starts to diffuse at a much lower temperature than the typical temperatures reached during fusion splicing, a significant amount of fluorine diffusion may occur during a typical fusion splicing operation. This diffusion results in a relatively high splice loss unless very short fusion times are used. Edvold is silent disclosing a barrier layer to prevent diffusion of the fluorine contamination the core. However, providing barrier layers is well known in the art to prevent diffusion of the dopants and facilitate core deposition as taught by Abe EPO 0091738 page 5. At the time the invention was made

it would have been obvious to a person of ordinary skill in the art to provide a barrier layer in the cladding or the core of Edvold MCDV method as taught by Abe in order to prevent the diffusion of dopants into the core.

Claims 10-12 are rejected under 35 U.S.C. 103(a) as unpatentable over Le Sergent (US 5,364,429) in view of Kyoto (US 5,203,899). Le Sergent is silent specifying the claimed core composition but does note that rare earth dopants in the core provide improved optical fibers having reduced thermomechanical stresses (Bridging paragraph of Col. 3-4). Thus at the time the invention was made it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have conducted routine experiments to determine the optimum composition of the core as an obvious optimization of result-effective variables which would render the resultant optical fiber with reduced thermomechanical stresses.

As for claim 12, fluorine would be added to the core to obtain the desired index of refraction as desired, as an index compensator.

Claims 1-8 and are rejected under 35 U.S.C. 103(a) as obvious over by Abe (EP 0091738) in view of Le Sergent (US 5,364,429). Abe discloses a multimode optical fiber having a cladding 12, a fluorine reservoir 16, and a core 14 (First paragraph on Page 5). As noted by Abe, the only region having fluorine is the fluorine reservoir 16. Therefore, the reservoir has a fluorine concentration higher than the core or the inner most cladding layer. The multimode optical fiber is made by well-known methods such as depositing a doped material on the inside of a substrate tube as claimed by

Art Unit: 1731

applicant. The substrate tube having the deposited soot for which consequently is made into the fiber disclosed by Abe, would inherently or at the least be obvious to a person of ordinary skill in the art, that said substrate tube have or be formed to have the same corresponding radial chemical profile as the resultant optical fiber. Thus, the claimed steps of depositing various cladding layers as done by Abe, with different fluorine concentration inside a substrate tube as recited in steps B-D would obvious to a person of ordinary skill in the art in order to produce the disclosed multimode optical fiber. Abe is silent disclosing adding active rare earth dopant to the core. However, Le Sergent teaches of adding rare earth dopant to the core in order to improve amplification characteristics of the resultant optical fiber (Le Sergent Bridging paragraph of col. 3-4). Thus at the time the invention was made it would have been obvious to a person of ordinary skill in the art to have added rare earth dopant to the core of Abe as taught by Le Sergent in order to improve the amplification characteristics of the formed optical fiber

As for claim 5, the alternative methods claimed are conventionally well known in the art as shown US 6571582.

As for claims 6-7, Abe discloses in page 5 of using a barrier layer to prevent the diffusion of dopants into the core.

As for claim 8, as noted by Abe, the concentration of the fluorine is sufficient to lower the refractive index of the reservoir 16 hence the fluorine amount at the very least be .7% mole.



### ***Response to Arguments***

Applicant notes that it is not understood why claims 25-32 were withdrawn from consideration. It was noted in the restriction requirement mailed on 11/6/03, "Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added." Applicant notes in page 2 of the election faxed on 12/3/03, "In response, Applicants elect to prosecute Species A from Group 1, which is believed to correspond to claims 1-21, and generic claim 35." Hence applicant never listed claims 25-32, as being readable on species A as required in the restriction requirement mailed on 11/6/03. Thus claims 25-32 were not considered.

Applicant's argument that Edvold does not disclose any reservoir, fails to comply with 37 CFR 1.111(b) because it amounts to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicant argues, "it is not possible to infer compositional constraints from a refractive index profile alone. For example, a layer with a higher index than silica may contain a substantial amount of fluorine if it also contains a substantial amount of an index raiser, such as germanium or phosphorus. Also, a layer with an index less than that of silica may contain no fluorine, but only boron, for example." Said argument is found unpersuasive, the argument does not make sense. The prior art would not decide to include an index raiser to then achieve the desired depressed refractive index by adding a substantial amount of fluorine, an index depressor. It is akin to argue that one of ordinary skill in the art would add sugar to a solution that is desired to be salty by then adding a substantial amount of salt.

Applicant also argues that the Edvold's depressed area may contain another index depressor not fluorine. Said argument is unpersuasive because the only index depressor disclosed by Edvold is fluorine not the alleged boron. In fact Edvold does not even contemplate the use of boron.

Applicant's arguments with respect to the Le Sergent reference has been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Lopez whose telephone number is 571.272.1193. The examiner can normally be reached on Mon.-Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571.272.1189. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
STEVEN P. GRIFFIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700